

Early Communications System (ECOMM) for ISS

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Abstract

The International Space Station (ISS) Early Communications System (ECOMM) was a Johnson Space Center (JSC) Avlonic Systems Division (ASD) in-house developed communication system to provide early communications between the ISS and the Mission Control Center- Houston (MCC-H). This system allows for low rate commands (link rate of 6 kbps) to be transmitted through the Tracking and Data Relay Satellite System (TDRSS) from MCC-H to the ISS using TDRSS's S-band Single Access Forward (SSAF) link service. This system also allows for low rate telemetry (link rate of 20.48 kbps) to be transmitted from ISS to MCC-H through the TDRSS using TDRSS's S-band Single Access Return (SSAR) link service. In addition this system supports a JSC developed Onboard Communications Adapter (OCA) that allows for a two-way data exchange of 128 kbps between MCC-H and the ISS through TDRSS. This OCA data can be digital video/audio (two-way videoconference), and/or file transfers, and/or "white board". The key components of the system, the data formats used by the system to insure compatibility with the future ISS S-Band System, as well as how other vehicles may be able to use this system for their needs are discussed in this paper

INTRODUCTION

The International Space Station (ISS) has a variety of communication systems for communications with the ground. Since the ISS will be assembled on-orbit and takes many flights until Assembly Complete (AC), these systems arrive and are activated at various stages in the assembly phase. The first U.S. communication system was assembled on-orbit by astronauts in December of 1998 as the US built Node (called Unity) was connected to the Russian built FGB (called Zarya). This Early Communications System (ECOMM) was a Johnson Space Center (JSC) Avlonic Systems Division (ASD) in-house developed communication system to provide early communications between the ISS and the Mission Control Center- Houston (MCC-H) via the Tracking and Data Relay Satellite System (TDRSS). The development activity was started in October of 1996. It was successfully concluded with the activation of ECOMM on ISS in December of 1998. This paper will present the major components of the ECOMM and the characteristics of the communication links.